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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,171	11/15/2003	Manouchehr E. Motamedi		9831

7590 06/08/2004

Ali Dabiri
2290 Middleton Way
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EXAMINER

BOUTSIKARIS, LEONIDAS

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 06/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/713,171

Applicant(s)

MOTAMEDI ET AL.

Examiner

Leo Boutsikaris

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/15/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities:

The serial number of a copending U.S. patent application cited in line 17, p. 4, must be updated (10/746,440).

The symbol “[3]” in the last paragraph of p. 4 must be deleted or changed.

Appropriate correction is required.

Claim Objections

Claims 1-10, 14-16 are objected to because of the following informalities:

In claim 1, line 2, the symbol “(?)” must be deleted.

In claims 6, 16, line 2, the word “incident” must be changed to “incidence”.

In claims 4, 14, the term “time delay” lacks antecedent basis.

Claims 2-10, 15 inherit the deficiency of claims 1 and 14, respectively, from which they depend.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 9, 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 9, 19, cite that the lens is “quasi optics focusing and collimating system based on an electro magnetic domain of operation” which is confusing, since it is not clear to what the term “quasi” refers to, and how it is related to the EM domain. For examination purposes it will be assumed that the lens is a focusing lens having focal length F .

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-9, 11, 13-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Everett (US 6,654,127).

Regarding claims 1, 11, Everett discloses an optical delay line scanning system (Fig. 2) comprising a grating 120; a lens 130 having a focal length f and placed at a distance F from the grating; a scanner mirror 140 placed at a distance F from the lens (since the scanned mirror contains the Fourier transform of the diffracted radiation) and placed such that an incident wave traversing an incident path will be diffracted by the grating 120 and directed through the lens to strike the scanner mirror, the mirror being rotated over a range 170 of scanning angles; and a

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bounced mirror 150 placed in a path parallel to an incident beam; and wherein the scanner mirror is rotated to direct the diffracted beam incident on the scanner mirror to strike the bounced mirror retro-reflecting the beam such that the beam retraces its path back through the system in a reciprocal manner, finally exiting from the system along the path it entered (lines 2-28, col. 3).

It is noted that the lens 130 is disposed at a grating output angle, i.e., perpendicular in the path of the diffracted beam, and the scanning mirror is placed at the back focal plane of the lens (lines 16-19, col. 3).

Regarding claims 3, 13, it is inherent that the grating 120 is designed to diffract the incident EM radiation.

Regarding claims 4, 14, the grating characteristics such as groove density, grating input angle and grating output angle are chosen such that a certain optical delay is achieved (lines 38-43, col. 3).

Regarding claims 5, 15, Everett's system is substantially the same as the system disclosed by Tearney (US 6,111,645), which is incorporated in Everett by reference (lines 51-54, col. 5). Tearney discloses an embodiment for the system where the groove density is 150 lines per mm (line 49, col. 10 in Tearney).

Regarding claims 6, 16, the diffraction of light from grating 120 is such that light is diffracted into the -1 order (see Fig. 2).

Regarding claims 7, 17, the grating/lens/scanning mirror elements are disposed in a 2F configuration since the scanning mirror contains the Fourier transform of the diffracted beam.

Regarding claims 8-9, 18-19, the lens 130 is a single, focusing lens.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Everett (US 6,654,127) in view of Palmer (Diffraction Gratings Handbook).

Everett discloses all the limitations of the above claims except for specifying that grating 120 is a blazed grating, so that the diffraction efficiency is enhanced. Palmer teaches that among different types of gratings, blazed gratings typically offer the highest diffraction efficiency (p. 104). It would have been obvious to one of ordinary skill in the art at the time the invention was made, to make the grating 120 in Everett's scanning system in a blazed form, as taught by Palmer, since blazed gratings yield the highest diffraction efficiency according to the blaze angle.

Claims 10, 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Everett (US 6,654,127) in view of Motamedi (US 5,903,380).

Everett discloses all the limitations of the above claims except for specifying that the system components may be made using MEMS technology, and in addition a thermal actuator is used to move the scanning mirror. Motamedi discloses an optical scanner system wherein the moving mirror is made using MEMS technology and furthermore, the micromirror comprises a bimorph actuator, whose operation is based on thermal effects, the actuator causing the

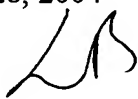
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micromirror to move over a range of scanning angles (Fig. 1 and Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made, to make the scanning mirror in Everett's system using MEMS technology, and more specifically utilizing a thermal actuator, as taught by Mutamedi, since such a monolithically integrated actuator provides a small, lightweight, low cost and robust optical device (see lines 6-8, col. 3 in Mutamedi).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Leo Boutsikaris whose telephone number is 571-272-2308.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leo Boutsikaris, Ph.D.
Patent Examiner, AU 2872
May 28, 2004

A handwritten signature in black ink, consisting of stylized initials 'LB'.